

Summary of reviewer comments for

“Environmental Water Program Pilot Flow Augmentation Project: Concept Proposal for Flow Acquisition on Lower Clear Creek”

Prepared by:

Ecosystem Restoration Program Proposal Review Office
University of California Davis – Extension

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This conceptual proposal was prepared in August 2004 for the Environmental Water Program/Ecosystem Restoration Program of the California Bay Delta Authority. The proposal was prepared by Stillwater Sciences in coordination with EWP staff and a group of local stakeholders and agency staff. Twelve reviewers, including experts from USF&WS, USBR, CADWR and academic institutions, provided evaluations of the conceptual proposal. ***The reviewers were unanimous in their opinion that continued development of a full, detailed proposal was warranted.***

All reviewers reacted positively to the concept of re-establishing flows that do geomorphic work in the Clear Creek watershed and to the idea of treating this restoration activity as an experiment within an adaptive management framework. The reviewers accepted the proposition that restoration of “mid-range flood flows (e.g. ~4,000-6,000 cubic feet per second for one day or more)” was preferable to other re-operation scenarios (e.g., elevated baseline flows, use of pulse flows to attract spawning salmon). The reviewers also supported the location of this experiment on Clear Creek (but some reviewers asked for more justification of this point, see below).

Each reviewer had comments, questions, and concerns with the proposal and these are outlined below. Some of these reviews were very detailed; thus, important concepts and details may have been lost in the act of consolidating these 12 reviews. Therefore, we recommend that selection panel members read the original reviews submitted by the individual reviewers.

OPERATIONAL REVIEWS

Six reviewers were asked to review operational/programmatic aspects of the proposal. Most of the operational/programmatic reviewers commented that any re-operation of Whiskeytown releases had the *potential* to affect these considerations:

1. Water supply. Several reviewers questioned the technical feasibility of achieving the desired flows using current facilities available at Whiskeytown, or worried about operational constraints imposed by overallocation of existing water supplies. These reviewers called for explicit and early coordination with the Bureau of Reclamation’s Central Valley Operations office. One reviewer recommended coordinating with the “B2 interagency team” to maximize the potential benefits of the re-operation of flow.

Project proponents’ indicate that no water will be purchased to produce the proposed modifications to Clear Creek flows. Operational/programmatic reviewers cautioned that it would be very difficult or impossible to find water available to purchase, if such purchases became necessary.

2. Water quality and environmental obligations, including impacts elsewhere in the CVP/SWP system. Several reviewers mentioned that re-operation of flows could have temperature impacts on salmonids in the Sacramento River below Keswick Dam and suggested communicating and coordinating with fisheries management agencies responsible for these fish. More consideration also should be given, reviewers said, to whether restrictions on flows created by existing environmental requirements will be barriers to re-operating flows in the manner outlined in the proposal.
3. Power generation. The proposed project will almost certainly involve forgone power generation. One reviewer questioned whether the projected costs of power acquisition were realistic. Coordinating with WAPA was recommended.

SCIENTIFIC/TECHNICAL REVIEWS

Six reviewers were asked to provide a scientific evaluation of the proposal. Many of these reviewers wrote very detailed evaluations and identified a wide-range of questions and concerns. Some of these concerns were shared by one or more other reviewers and these shared concerns are summarized below.

1. Justification. Two reviewers asked for more substantial justification for targeting Clear Creek as the location for this experiment in hydrograph restoration. These reviewers wanted clarification of the regional importance of restoring this watershed.
2. Goals and objectives. All reviewers were impressed that the proponents outlined predicted results of the proposed restoration activity. But, several reviewers wanted more specific predictions of the effect of restoring certain flow levels to Clear Creek. For example, one reviewer asked “What will success look like?” Other reviewers requested specific information/predictions on the effect of re-operation on temperatures within Clear Creek and in the Sacramento River.
3. Conceptual model. The conceptual model in the proposal emphasizes changes in geomorphic conditions following restoration of mid-level flood flows. The project proponents argue that the desired geomorphic conditions will produce biological benefits, particularly to salmonids. Many reviewers questioned the project proponents’ relatively narrow focus on geomorphic conditions that were *assumed* to be desirable for salmonids.

In general, the reviewers felt that predicted consequences of flow restoration should be broadened to consider other effects of flow restoration. The reviewers called for specific predictions and subsequent monitoring of how project-induced geomorphic changes would impact salmonids, non-salmonid fishes (particularly the predicted effect on the balance between native and non-native fishes), aquatic invertebrates, terrestrial plants, and terrestrial mammals. One reviewer called for a more detailed discussion of the predicted change in groundwater-surface water interaction resulting from re-operation.

4. Study design. Several technical reviewers commented on the need to increase the involvement of decision-makers in the design and implementation of this project (*See Collaboration and coordination* above). They argued that, in an adaptive management framework, managers and decision-makers must be involved at the earliest stages of project design in order to insure that the questions asked, data collected, and contingency responses were appropriate. Also, they pointed out that the results of the experiment would be more

likely to influence future management decisions if a wide array of decision-makers were involved in the project design phase.

Several reviewers were concerned by the project's continued reliance on gravel augmentation to support salmonid restoration in Clear Creek. They stated that the expense of gravel augmentation will continue to increase and that the cost estimates for this augmentation could turn out to be inadequate.

5. Monitoring. Reviewers highlighted several concerns about monitoring

- **Cost.** The adequacy of monitoring cost estimates was questioned by at least one reviewer.
- **Baseline.** At least one reviewer observed that, in order to analyze the impact of restoration on physical and biological conditions, monitoring of baseline geomorphic, water quality, and biological conditions should be conducted for several years and in several seasons *prior to* restoration of flood flows.
- **Breadth of predictions and monitoring.** Consistent with their recommendations to expand conceptual models underlying the project, the reviews questioned the project proponents' relatively narrow focus on monitoring of geomorphic conditions and called for monitoring of the direct impacts on salmonids (larval and juvenile surveys), non-salmonid fishes, aquatic invertebrates, terrestrial plants, and terrestrial mammals.
- **Coordination with other monitoring efforts.** Several reviewers cautioned against relying solely on existing biological monitoring programs to evaluate impacts in Clear Creek. Existing biological monitoring programs do not necessarily collect data that will be useful for evaluating the specific impacts of the proposed restoration effort. Also, these reviewers felt that the uncertainty surrounding the future of these existing sampling programs warranted increased biological monitoring efforts specific to the proposed flow restoration.
- **Scale and measurement of impacts.** Each scientific/technical reviewer commented on at least one mismatch between the scale of the proposed restoration and the measurement of restoration's impact. Some reviewers felt that it would be difficult to gauge the impact of flow restoration on Clear Creek without monitoring biological and water quality response variables elsewhere in the Sacramento Valley. These monitoring efforts would establish a "control" or context against which progress at Clear Creek could be evaluated. On the other hand, at least one reviewer cautioned about the difficulty of relating micro-habitat conditions to flow restoration on such a large stretch of Clear Creek.

Several reviewers commented on a temporal mismatch between the rate at which geomorphic conditions could be restored and the rate at which biological indicators would respond to that restoration. At least two technical reviewers asked that the project proponents specify the time scale at which the hypotheses listed on pp. 42-43 would be measured and evaluated.

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